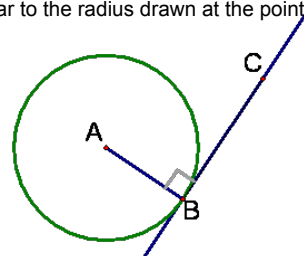


# 11-2 Properties of Tangents

Theorem 11.1-If a line is tangent to a circle, then it is perpendicular to the radius drawn at the point of tangency.



Theorem 11.2-In a plane, if a line is perpendicular to the radius of a circle at its endpoint on the circle, then the line is tangent to the circle.

Find the radius if AC = 5 and BC = 4

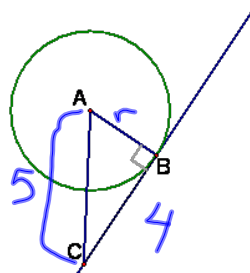
$$c^2 = a^2 + b^2$$

$$5^2 = r^2 + 4^2$$

$$25 = r^2 + 16$$

$$9 = r^2$$

$$3 = r$$



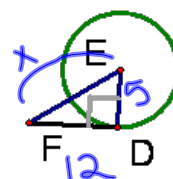
Find EF, if DE = 5 and DF = 12.

$$X^2 = 5^2 + 12^2$$

$$25 + 144$$

$$X^2 = 169$$

$$X = 13 = EF$$



$$(x+5)^2$$

$$(x+5)(x+5)$$

FOIL

$$x^2 + 5x + 5x + 25$$

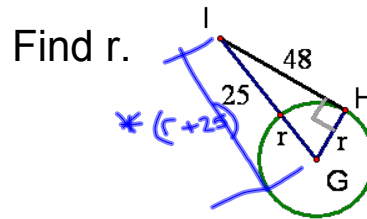
$$x^2 + 10x + 25$$

$$(x+7)^2$$

$$(x+7)(x+7)$$

$$x^2 + 7x + 7x + 49$$

$$x^2 + 14x + 49$$



$$(r+25)^2 = r^2 + 48^2$$

$$(r+25)(r+25) = r^2 + 2304$$

$$r^2 + 25r + 25r + 625 = r^2 + 2304$$

$$r^2 + 50r + 625 = r^2 + 2304$$

$$-625 \quad -625$$

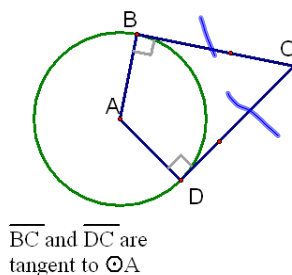
$$50r = 1679$$

$$50 \quad \cdot 50$$

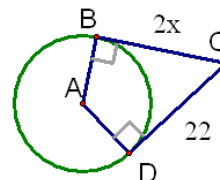
$$r = 33.6$$

Theorem 11.3-If two segments from the same <sup>pt</sup> outside of a circle are tangent to the circle, then they are congruent.

$$BC = DC$$



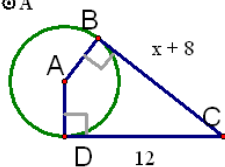
$\overline{BC}$  and  $\overline{DC}$  are tangent to  $\odot A$



$$2x = 22$$

$$x = 11$$

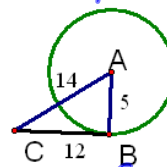
$\overline{BC}$  and  $\overline{DC}$  are  
tangent to  $\odot A$



$$x + 8 = 12$$

$$x = 4$$

Is  $\overline{CB}$  a tangent? **NO**



Check to see if pyth. thm works.

$$14^2 \stackrel{?}{=} 5^2 + 12^2$$

$$196 \neq 25 + 144$$

$$196 \neq 169$$

HW

p598-599

4-13, 17-21